

# Get in motion...it's easy with BRX

All BRX PLC models with 24VDC I/O have high-speed inputs and outputs built in with an additional 128 250kHz or 128 TTL (64 differential) 2MHz local high-speed points possible through expansion. This high-speed I/O can be used to track rapid encoder pulses, drive stepper motors, or can be configured for other counter/timer, axis/pulse, pulse-width-modulated or table-driven functions:

- **Timer/Counter:** BRX PLCs can be configured to count input pulses, or measure the time between pulses, up to a 2MHz maximum pulse rate.
- **Axis/Pulse:** BRX PLCs can control up to 27 independent axes of motion or 7 groups of coordinated motion with additional virtual axes for internal control and following applications.
- **Pulse Width Modulation (PWM):** The high-speed outputs can also be used to generate a carrier frequency with varying pulse widths.
- **Table-driven:** Tables of preset values can be used to turn the high-speed outputs ON and OFF based on the pulse count values of one high-speed input.

## Ignore the noise...for accurate control

Single-ended signaling is the simplest, and in terms of wire cost, the least expensive method of transmitting high-speed electrical signals. With this type of transmission, one wire carries a voltage that represents the signal while the other wire is connected to a reference voltage, usually ground. This wiring method can pose a serious problem in industrial applications that are prone to electromagnetic interference from motors, compressors, power generation, etc. The noise induced on nearby wires from these devices can cause inaccurate counts, inconsistent positioning, or erratic motion profiles.

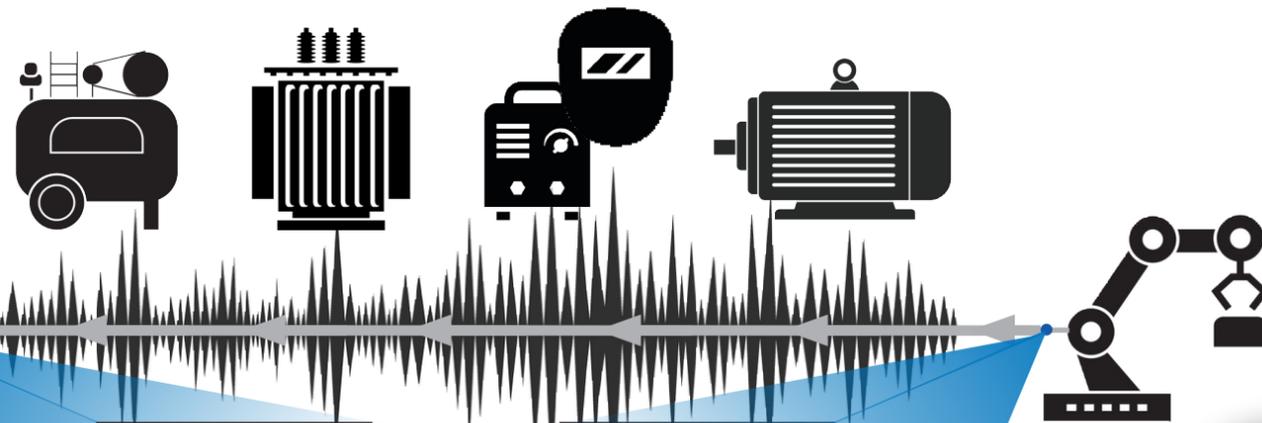
On the other hand, differential signaling ignores the noise that is induced on the line and focuses on the difference in the supplied signals. This type of transmission requires an additional wire, with one carrying the normal signal and the other carrying its inverse. Any noise induced on the wires will affect both the normal and inverse signals the same, causing the difference between the signals, or differential, to remain the same as well. By focusing on the differential, the BRX HSIO4 module can effectively void any inaccuracies caused by noise.

All BRX CPUs with 24VDC I/O have 250kHz high-speed inputs/ outputs built in.

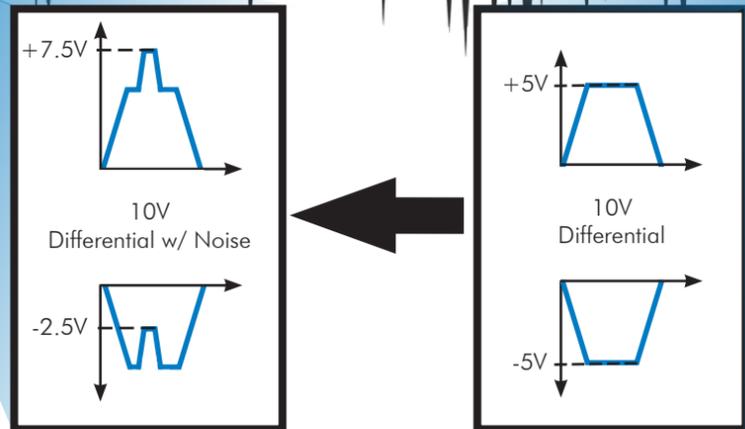
For even more motion, add up to an additional 128 250kHz or 2MHz high-speed channels using HSIO expansion modules.



**FREE Software!**  
No license or key needed.  
[Click here to download.](#)



The BRX HSIO4 module offers both TTL and differential I/O at 2MHz. Differential I/O can be used to prevent inaccuracies in high-speed signals caused by electrical interference from high-noise environments.



High-speed I/O Modules starting at only **\$219.00**



# “Hey Google<sup>®</sup>, ask BRX to go home”

BRX PLCs are on the forefront of Industry 4.0 with support for MQTT, HTTPS and FTP communication plus an embedded Rest API which allow BRX to work hand-in-hand with high-level IT systems/IIoTT platforms.

BRX PLCs are also a leader in advanced motion control with embedded and expandable high-speed I/O and powerful motion-specific instructions that can tackle even the most complex, coordinated motion applications.

Each of these features (IIoT capability and advanced motion) alone are pretty impressive, but using them together allows for some awesome innovations. Imagine controlling your machine's movements with just your voice - telling it to “reset”, “stop” or “run motion profile 3”. How about having the status of the machine read aloud to you just by asking Google Assistant, well with BRX PLCs you don't have to imagine, you can easily make it a reality.



Input Leg

Edge triggered  
 Power flow enabled

Target Type

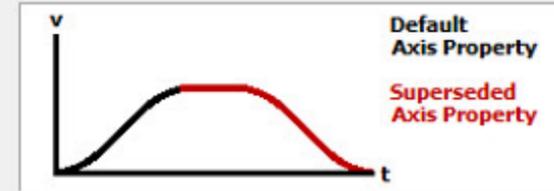
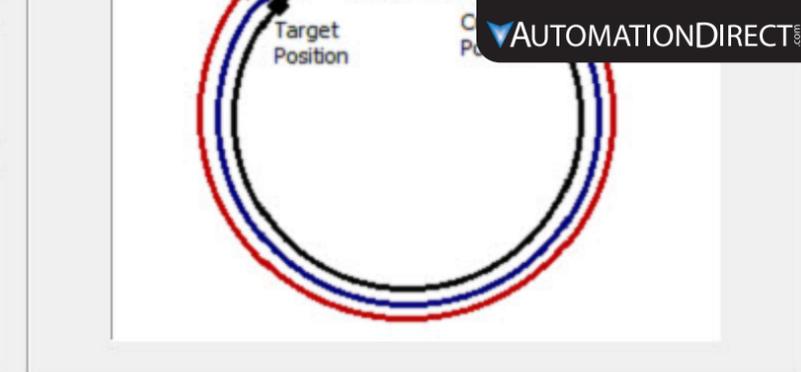
Absolute  
 Relative

Zero-out .CurrentPosition before initial run

Position Value

Linear vs. Rotary

Linear



Jerk  pulses/sec<sup>3</sup>

Supersede Default Properties

Maximum Velocity  pulses/sec

Acceleration  pulses/sec<sup>2</sup>

Deceleration  pulses/sec<sup>2</sup>

On Success:  Set bit  JMP to Stage

On Error:  Set bit  JMP to Stage

**AWESOME INNOVATIONS**

BRX PLC's advanced IIoT capabilities combined with its powerful motion control can create some pretty awesome innovations. Click the video to see BRX IIoT in motion.



**BRX PLCs starting at only \$197.00 (BX-DM1-10AR-D)**

Axis Electronic Camming

Pt#	Raw Master Value	Curve Fitting Points	Slave Value
1	0	0	0
2	143	200	200
3	286	200	200
4	429	200	200
5	571	100	100
6	714	100	100
7	857	0	0
8		Rotary Modulus 0 [ 1000 ]	0

### High Speed/Motion Instructions

AXCAM - Axis Electronic Camming	AXSCRIPT - Run a Sequence of Axis Commands
AXCONFIG - Axis Configuration	AXSETPROP - Set Axis Properties
AXFOLLOW - Axis Position Following with Offset	AXVEL - Axis Set Velocity Mode
AXGEAR - Axis Electronic Gearing	PWMOUT - Pulse Width Modulated Output
AXHOME - Axis Perform Home Search	TDODECFG - Deconfigure Table Driven Output
AXJOG - Axis Jog Mode	TDOPLS - Load Programmable Limit Switch Table for Table Driven Output
AXPOSSCRV - Axis Move to Position Using S-Curve	TDOPRESET - Load Preset Table for Table Driven Output
AXPOSTRAP - Axis Move to Position Using Trapezoid	
AXRSTFAULT - Reset Axis Fault	

**BRX has it all - up to 27 axes of coordinated motion and up to 9 virtual axes with high-powered motion instructions and IIoT features mixed in!**

Master Position Offset

Load Slave Curve Fitting Points from Data Block

Length from Starting Master Position

Number of Curve Fitting Points

Slave Curve Fitting Table Starting Address

Fixed Curve Fitting Points (hit "Apply to table" if you make any changes)

Length from Starting Master Position

Number of Curve Fitting Points

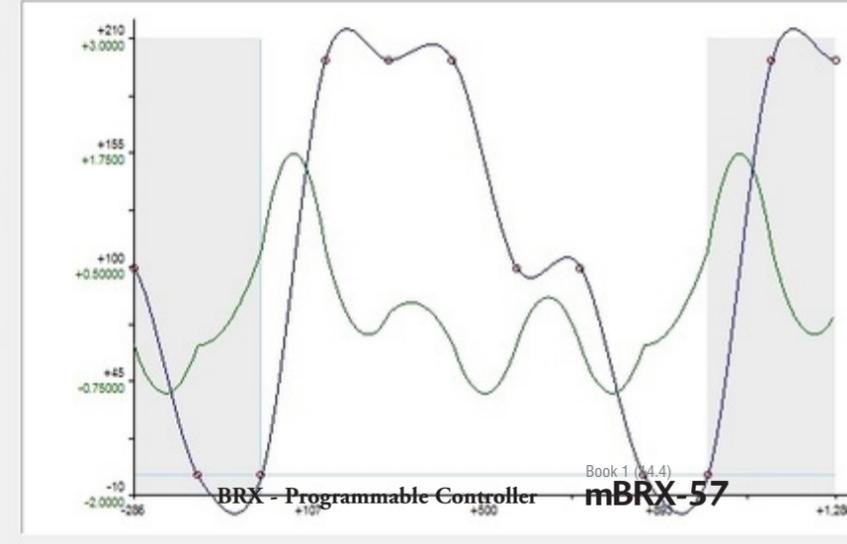
Enable Relative Mode

On Success:  Set bit  JMP to Stage

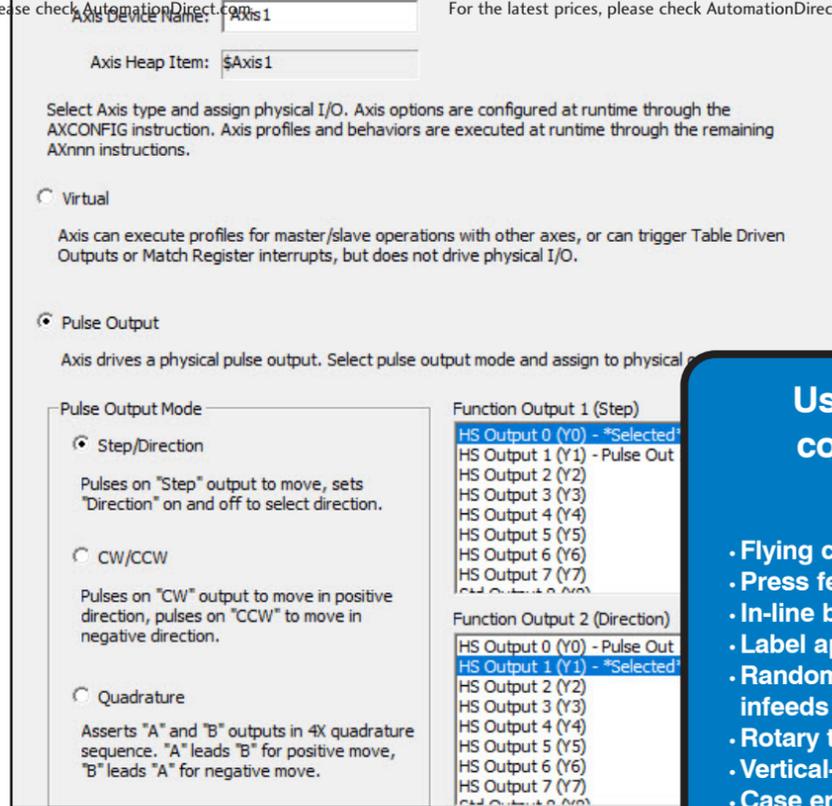
On Error:  Set bit  JMP to Stage

Automatically create the SG box for any NEW stage number

Below this rung  
 At end of code-block

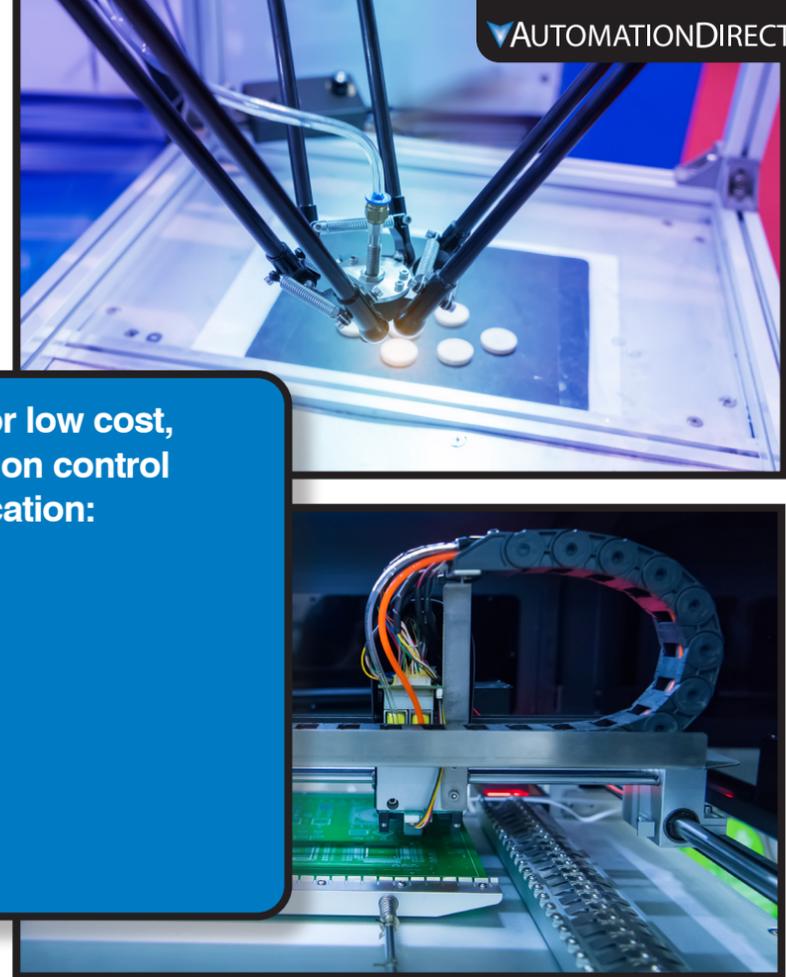


# Advanced motion in 3 easy steps



**Use BRX PLCs for low cost, coordinated motion control in any application:**

- Flying cut-off systems
- Press feeds
- In-line bottle filling
- Label applicators
- Random timing infeeds
- Rotary tables
- Vertical-form-fill-seal
- Case erectors/pack-



## 2 CONFIGURE AXES

From the Do-more Designer software, configure the axes for your system. Choose whether the output will be a pulse output or virtual one and select the correct pulse output mode (if needed). Assign your tags and you are ready to design your motion profile.

## 3 SET UP MOTION PROFILE

Do-more Designer software includes many easily configured function blocks for several common motion profiles. Choose the one you need and fill in the blanks for your particular application. If you need a custom profile, the AXSCRIPT instruction allows you to create your own sequence of axis commands. Once you have your profile complete, download the project to the BRX CPU and you're done!

**BUILD YOUR OWN!**  
Create custom position & velocity move profiles

## 1 INSTALL HARDWARE

Install the BRX PLC (you can use the built-in high-speed I/O and/or the HSIO expansion modules), install the servo and/or stepper drive(s) and associated motors, wire up the system, power the controller and drive(s) and download the free Do-more Designer software to your PC if you haven't already.

